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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/183,479	10/30/1998	MICHAEL JAMES LIBERATORE	SAR12743	3193

7590

05/24/2004

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EXAMINER
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MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/183,479	LIBERATORE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Melvin Curtis Mayes	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-15 and 17-22 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

(1)

A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on April 8, 2004 has been entered.

### *Claim Rejections - 35 USC § 103*

(2)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(3)

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974).

IBM Technical Disclosure Bulletin (April 1974) discloses a method of screen printing on indented green sheets to form a multilayer ceramic module having screen-printed lines of increased conductivity comprising: pressing indentations of desired conductor patterns into the PVA coated side of a green sheet by hot stamping using an embossed metal plate under temperature and pressure; filling the indentation by screen printing by squeegeeing conductive paste of metal powder and organic vehicle into the indentations; stacking green sheets; and co-firing.

By hot stamping conductor pattern indentations in the PVA coated surface of the green sheet, a step of embossing a channel directly on the surface of a green tape is obviously performed, as claimed, because the indentations are directly on the surface of the green sheet.

(4)

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) as applied to claim 12, and further in view of Amendola et al. 4,546,065.

Amendola et al. teach that in embossing indentations into a ceramic green sheet by pressing a die against the surface of the greensheet, embossing conditions involve heating the greensheet to a temperature at which the binder in the greensheet flows and can be shaped under pressure such as 75° to about 95°C (167-203°F) and pressure of 500 to 3000 psi (col. 7, lines 3-33).

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) by hot stamping the indentations in the green sheet under pressure and temperature in the ranges of 75° to about 95°C (167-203°F) and 500 to 3000 psi, as taught by Amendola et al. as temperatures and pressures suitable for embossing indentations in a green sheet. Hot stamping (embossing) at temperatures and pressures within the ranges as claimed in Claims 13 and 14 would have been obvious to one of ordinary skill in the art, as taught by Amendola et al.

(5)

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) as applied to Claim 12, and further in view of Vitriol et al. 5,028,473.

Vitriol et al. teach that in a multi-layer co-fired ceramic, electrical circuit patterns on the green sheets include not only metallizations but may further include resistors, capacitors,

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inductors and other electrical components compatible with the process, the patterns formed on the sheets by screening or any other suitable method (col. 4, lines 57-63).

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) for making a multilayer ceramic module by also screen printing resistors or capacitors in indentations in the green sheet, as taught by Vitriol et al., as also screened on green sheets for making a multi-layer, co-fired ceramic laminate. Screen printing the green sheet with conductive paste and resistor paste or capacitor paste would have been obvious to one of ordinary skill in the art as Vitriol et al. teach that in a multi-layer co-fired ceramic, these electrical components may also be included by screen printing.

Screening capacitors using an ink or paste of lead magnesium niobate or barium titanate, as claimed in Claims 19 and 20, would have been obvious to one of ordinary skill in the art as these materials conventionally used for capacitors.

(6)

Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) as applied to Claim 12, and further in view of Hayama et al. 5,609,704.

Hayama et al. teach that when filling a groove with conductive paste, the volume of the paste filling the groove is reduced by an amount corresponding to the evaporated organic solvent and teaches that the filling is repeated to fill up the reduced amount so that the thickness of the paste can be set at the same value at the depth of the groove (col. 8, lines 16-27).

It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) for making a multilayer ceramic module by repeating the step of screen printing the paste in the indentations, as taught by Hayama et al., to set the thickness of the paste in the indentation to the same value as the depth of the indentation, as paste upon drying reduces in volume by an amount corresponding to the evaporated organic solvent.

(7)

Claims 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over IBM Technical Disclosure Bulletin (April 1974) in view of Prabhu 5,277,724.

IBM Technical Disclosure Bulletin (April 1974) discloses a method of screen printing on indented green sheets to form a multilayer ceramic module having screen-printed lines of increased conductivity comprising: pressing indentations of desired conductor patterns into the PVA coated side of a green sheet by hot stamping using an embossed metal plate under temperature and pressure; filling the indentation by screen printing by squeegeeing conductive paste of metal powder and organic vehicle into the indentations; stacking and laminating green sheets; and co-firing. IBM Technical Disclosure Bulletin (April 1974) does not disclose laminating the green sheets onto a metal support coated with a low melt temperature glass.

Prabhu teaches that multi-layered, co-fired ceramic on a metal base is formed by utilizing a bonding layer of low softening point glass and co-firing to bond the ceramic to the metal base. The bonding layer of glass provides a means of attaching the multi-layered ceramic to the base and minimizes shrinkage of the ceramic during the firing (col. 1, line 55 - col. 2, line 48).

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It would have been obvious to one of ordinary skill in the art to have modified the method of IBM Technical Disclosure Bulletin (April 1974) for making a multilayer ceramic module by co-firing the laminated green sheets on a metal base using a low melting bonding layer of glass, as taught by Prabhu, for attaching a multi-layered ceramic to a base and minimize shrinkage of the ceramic during firing.

By hot stamping conductor pattern indentations in the PVA coated surface of the green sheet, a step of embossing a channel directly on the surface of a green tape is obviously performed, as claimed, because the indentations are directly on the surface of the green sheet.

*Allowable Subject Matter*

(8)

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Conclusion*



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(9)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tanaka et al. 5,410,957 and Balz et al. 5,927,193 teach that screen printing uses a squeegee and mask, template or stencil.

Arnold et al. 4,562,513 and Schmeckenbecher 3,948,706 teaches that the PVA coating on green sheet acts as a mask for allowing paste to be squeezed into indentations pressed into the green sheet.

(10)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 571-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
May 18, 2004